

they were retrospectively analyzed, and being an observational study, causality could not be determined.

CONCLUSIONS

A third of deaths and complications after EVAR are postdischarge. Patient characteristics associated with a higher risk for postdischarge adverse events after EVAR were identified. Whether improved predischARGE surveillance and close postdischarge follow-up of identified high-risk patients will further improve 30-day outcomes after EVAR needs to be prospectively studied.

AUTHOR CONTRIBUTIONS

Conception and design: PG, BR

Analysis and interpretation: TE, XF, DY, JH, CA

Data collection: PG, BR

Writing the article: PG, TE, BR, XF

Critical revision of the article: DY, JH, CA

Final approval of the article: PG, TE, BR, XF, DY, JH, CA

Statistical analysis: PG, BR, XF

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Overall responsibility: PG

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DISCUSSION

Dr Hasan Dosluoglu (Buffalo, NY). A previous study by Dr Kent's group had found that one of the most common reasons for readmissions following open and endovascular abdominal aortic aneurysm repairs was wound complications. So this to me is another reason to consider percutaneous interventions. Do you have data on this data set on how many of these patients with wound complications were done percutaneously and how many had open femoral exposure? In that paper, 46% were percutaneous, and this study is on a more recent time period.

Dr Prateek K. Gupta. National Surgical Quality Improvement Program (NSQIP) is essentially based on Current Procedural Terminology (CPT) codes for procedures. While there are CPT codes for femoral cutdowns, there are no codes for a percutaneous approach. Thus, we deliberately excluded looking at patients for percutaneous vs a cutdown approach, as many times that particular approach might not have been coded for, resulting in a coding error and possibly false results due to that.

Dr Matthew Mell (Stanford, Calif). My question is about patient selection. It is sobering that a third of early deaths after

elective operations occurred outside of the hospital, and I wonder if you could comment on the contribution of marginal patients to this observation.

Dr Gupta. We see that the event rate for death is pretty low, it is around 1%, and it has gradually gotten better over the last decade. However, as you said, a third of these are after discharge. The study does identify the patients who are at high-risk after the operation, and focusing on these patients may improve patient selection—and thus outcomes.

Dr Anton Sidawy (Washington, DC). I would just like to point out that this 30% postdischarge complication rate is not only limited to EVAR. We presented a few years ago at the Vascular Annual Meeting the results of the Society for Vascular Surgery Carotid Registry, and in both open carotid endarterectomy and carotid angioplasty and stenting, we had a postdischarge complication rate of about 25% to 30% up to 30 days. Since we are encountering this in different areas of vascular surgery, maybe we should double our efforts to figure out how we can predict which patient is going to have a complication after discharge.

Dr Gupta. I think it is a very valid point. With all interventions that have relatively shorter hospital length of stay, we are seeing most of the complications occurring postdischarge. Maybe the follow-up protocols for these should be different compared to the open operations where patients stay in-house for a longer duration before they go home.

Dr Thomas Riles (*New York, NY*). I noticed that one of the pre-op risk factors was not renal failure, but you had so many

people die of renal failure post-op. Can we presume that those renal complications resulted from the surgery?

Dr Gupta. Yes, those renal complications resulted from the surgery. We did specifically look for preoperative renal failure and controlled that using interactions; however, for this particular cohort, preoperative chronic renal failure requiring dialysis was not associated with postdischarge mortality or morbidity. Being all elective patients, preoperative acute renal failure was excluded.



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